

Amendments to the Specification

Please amend the specification as follows:

Please delete the paragraph on page 2, lines 2-6, and insert the following in place thereof:

The present application is a continuation of U.S. Patent Application Serial No. 09/579,529 filed May 26, 2000, now issued as U.S. Patent No. 6,721,363, which in turn claims priority from Provisional U.S. Patent Application Serial No. 60/140,705 filed June 24, 1999 and Provisional U.S. Patent Application Serial No. (UNASSIGNED, DOCKET NO CRUS-0156) 60/140,825 filed on June 26, 1999, both of which are incorporated herein by reference.

Please delete the paragraphs on page 2, lines 9-16, and insert the following in place thereof:

~~Attorney docket No: 0931~~ U.S. Patent Application Serial No. 09/592,539 filed June 12, 2000 entitled "Digital Impairment Learning Sequence", now issued as U.S. Patent No. 6,301,296 on October 9, 2001;

~~Attorney docket No: 0932~~ U.S. Patent Application Serial No. 09/598,934 entitled "Pad Detection";

~~Attorney docket No: 0933~~ U.S. Patent Application Serial No. 09/598,680 filed June 21, 2000 entitled "Inter-Modulation Distortion Detection";

~~Attorney docket No: 0934~~ U.S. Patent Application Serial No. 09/572,860 entitled "Constellation Generation and Re-evaluation" filed May 18, 2000, now issued as U.S. Patent No. 6,721,357 which is incorporated by reference;

Please delete the paragraph beginning on page 9, line 9, continuing through page 10, line 2, and insert the following in place thereof:

Comparing to the pre-V.90 standard modem (X2 and Kflex), one of the big advantages of V.90 modem is it is capable of achieving optimal performance based on individual loops. The DIL descriptor asks digital modem 510 to send desired Ucode sequence, which, when received by analog modem 530, ~~are~~ is used to create the receiver code super constellations. The so-called DIL points are averages of number of linear equalizer outputs corresponding to the same Ucode in the same slot. The accuracy of the received DIL points is one key for V.90 performance. The received linear values may be matched to the closest decoded linear values, using the linear-to-PCM-conversion algorithm. For this reason, ~~is it~~ it may be necessary to first perform RBS detection.

Please delete the paragraph on page 10, lines 10-15, and insert the following in place thereof:

RBS detection is disclosed in more detail in Provisional U.S. Patent Application Serial No. ~~60/140,075~~ 60/140,705 filed June 24, 1999 and copending U.S. Patent Application ~~Attorney Docket No. 0933~~ Serial No. 09/598,680 entitled "Inter-Modulation Distortion Detection" also claiming priority from Provisional U.S. Patent Application Serial No. 60/140,075.

Please delete the paragraph on page 11, lines 12-19, and insert the following in place thereof:

Pad gain may be detected by any one of a number of techniques, including the technique disclosed in Provisional U.S. Patent Application Serial No. ~~60/140,075~~ 60/140,705 filed June 24, 1999 ~~incorporated herein by reference~~ and in co-pending U.S.

Patent Application ~~Attorney Docket No. 0932-09/598,934~~ entitled "Pad Detection", also claiming priority from Provisional U.S. Patent Application Serial No. ~~60/140,075~~ 60/140,705. Digital PAD is one kind of digital power loss measured in dB.

Please delete the paragraph on page 12, lines 1-7, and insert the following in place thereof:

There are a limited number of known digital PADs, (e.g. 0dB, 3dB, 3.5 dB, 6db and 8dB). Once the amount of digital PAD is known, several typical constellation points may be pre-calculated independently of RBS. Then digital loop (PAD information) may be determined, using a matching pursuit method. A similar but different approach is disclosed in proposed in Application ~~Attorney Docket No. 0932~~ Serial No. 09/598,934 entitled "Pad Detection".

Please delete the paragraph on page 14, lines 1-6, and insert the following in place thereof:

By this algorithm, the DIL linear equalizer outputs are converted to PCM Ucode indices. They then may be matched to the closed G.711 (μ or ~~a-law~~ A-law) values. This is a de-noising processing, which increases the accuracy of the DIL data. The mathematical formula for the linear-to-Ucode conversion (for μ -law only) is formulated as follows (It is similar for A-Law).

Please delete the paragraph on page 15, lines 11-16, and insert the following in place thereof:

$\frac{1}{2}$ RBS detection is disclosed in more detail in Provisional U.S. Patent Application Serial No. ~~60/140,075~~ 60/140,705 file June 24, 1999 ~~incorporated herein by reference~~ and

in co-pending U.S. Patent Application ~~Attorney Docket No. 0932-09/598,934~~ entitled "Pad Detection", also claiming priority from Provisional U.S. Patent Application Serial No. ~~60/140,075~~ 60/140,705.

Please delete the paragraph on page 16, lines 11-16, and insert the following in place thereof:

IMD correction may be first applied if needed to ~~the de-noised~~ de-noise the decode levels. Next, ideal points corresponding to the holes in the DIL sequence are added in case the channel is very clean and the pad and codec are one of the standard ones (0dB, 3dB, 6dB, ~~a-law~~ A-law) so as to increase the data rate possibilities and V.90, modem throughput.

Please delete the paragraph on page 17, lines 13-19, and insert the following in place thereof:

In Example 1 a pad gain of 323Bh (12859 decimal) was previously determined using the techniques set forth U.S. Provisional Patent Application Serial No. ~~60/140,075~~ 60/140,705 file June 24, 1999, ~~previously incorporated herein by reference~~. Pad gain is first converted to a decimal value, where a pad gain of 7FFF (32767 decimal) is equated to a pad value of 1.0. Thus, pad gain in this instance = $12859/32767 = 0.3924$.

Please delete the title heading at the top of page 32 as follows:

RECEIVER CODEC SUPER SET CONSTELLATION GENERATOR